

Clegg VENUS

SSB Transceiver For 6 Meters

INSTRUCTION MANUAL

WARRANTY

Squires-Sanders, Inc. warrants the equipment herein described to be free from defective material or factory workmanship and agrees to remedy any such defect, by repair or replacement at the company's option, which in the company's judgement is a fault of its manufacturing, for a period of 180 days from date of original purchase and provided that the owner warranty registration card is returned within 10 days after purchase, and provided further that the equipment is returned to the factory or its authorized representative in accordance with Squires-Sanders instructions and with transportation charges prepaid.

This warranty specifically excludes accessories, including vacuum tubes, not of the company's manufacture except to the extent such items may be warranted to Squires-Sanders by the manufacturer thereof. Warranty shall be invalid in the event of (a) unauthorized repair or alteration, (b) misuse, negligence or accident, (c) connection, installation or operation in a manner at variance with instruction manual, or (d) alteration, disfigurement or removal of serial number.

Squires-Sanders reserves the right to make any change in design, or to make addition to, or improvements in, its products without assuming any obligation to install them in its products previously manufactured.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

Squires-Sanders, Inc.

475 WATCHUNG AVENUE, WATCHUNG, N.J. • 755-0222

Note: In the event of damages resulting from shipment, a direct claim against the common carrier must be made by the customer.

WARRANTY REGISTRATION CARD

CLEGG VENUS R.F.

SER. # ¹¹⁵ 617082

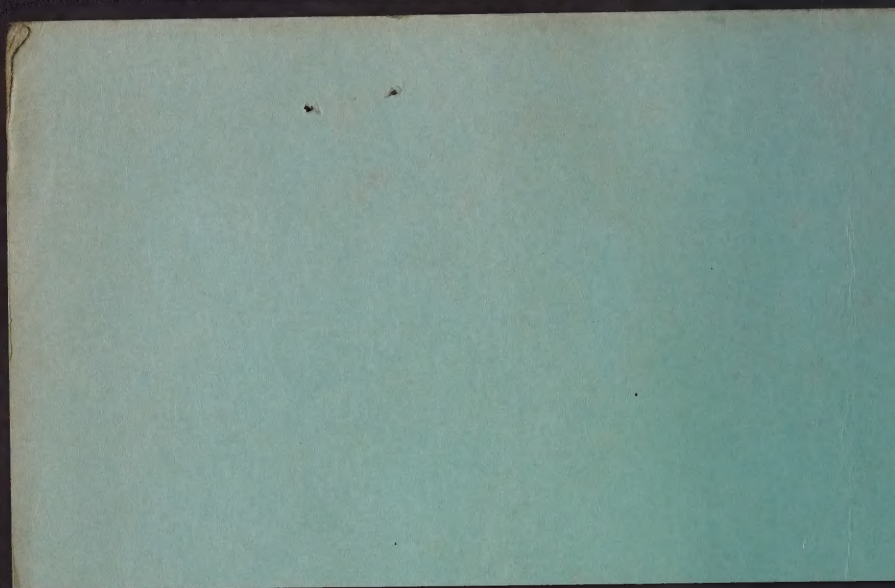
CALL:

Purchased by _____

Address _____

Purchased from _____

Date of Purchase _____



ADDENDA

CLEGG VENUS MANUAL

POWER SUPPLY DATA

The Clegg Model 416 power supply/speaker combination for use with the VENUS transceiver is not available at this time. Until this power supply is available, the VENUS can be successfully operated with a National NCXA supply which, like the Clegg 416, includes a 4 ohm speaker. The interconnecting cable as received with the NCXA may be used directly with the VENUS. It is suggested, for general safety, that the NCXA and VENUS instruction books be compared as to pin voltages prior to connecting.

1/30/64

INSTRUCTION MANUAL

Clegg VENUS

SSB Transceiver For 6 Meters

CLEGG LABORATORIES DIVISION
Squires-Sanders, Inc.

ROUTE 53, MOUNT TABOR, N. J.

Copyright 1963

Squires - Sanders, Inc.

475 WATCHUNG AVENUE

WATCHUNG, N.J.

TABLE OF CONTENTS

I.	DESCRIPTION	
	A. General	1
	B. Operating and Performance Features	1
	C. Specifications	2
II.	INSTALLATION	
	A. Unpacking	5
	B. Installation (Fixed Station)	5
III.	OPERATION	
	A. Initial Receiver Operation	7
	B. Initial Transmitter Operation	9
	C. Maintenance Adjustments	11
	D. Use of Accessory Equipment	12
IV.	THEORY OF OPERATION	
	A. Receive Mode Functions	13
	B. Transmit Mode Functions	13
V.	VOLTAGE AND RESISTANCE CHART	14
VI.	PARTS LIST	17



FIG. 1—CLEGG VENUS SSB TRANSCEIVER FOR 6 METERS

I. DESCRIPTION

A. General (See Figure 1)

The Clegg Venus is a high quality compact attractively styled SSB receiver and transmitter that puts you on 50 mc single sideband without all the fuss, bother and expense associated with adopting low frequency SSB exciters, crystal controlled converters, relays, linear amplifiers, etc.

Employing all the latest circuit techniques, the Venus, in one small package, provides a combination of advanced operating features and conveniences heretofore unavailable in rigs at any price.

B. Operating and Performance Features

1. A nuvistORIZED front end for maximum sensitivity and extremely low noise figure.
2. Crystal lattice filter in both receive and transmit positions.
3. Balanced beam tube modulator.
4. Receiver Offset control provides ± 1.5 KC tuning of the receiver frequency, independently of transmitter. This is especially desirable for net operation where many stations are frequently off frequency.
5. An effective peak noise limiter functions with the diode detector in AM operation while adjustable threshold limiting provides excellent rejection of impulse noise on SSB and CW.
6. The tuning dial assembly that drew raves from thousands of ZEUS and INTERCEPTOR users has been further refined for use in the Venus, to accurately read 1 KC per division, so desirable for SSB operation. The Main tuning dial tunes 10 KC per revolution.
7. Slow AVC release is carefully designed to the special requirements of VHF SSB.
8. An expanded scale relative output meter permits simple and precise (front panel controlled) carrier balance adjustment, and output tuning indication. The same meter also serves as an accurate S meter on receive.

9. A second panel meter continuously monitors cathode current of transmitting output amplifier tube.
10. Broad band circuits throughout provide maximum simplicity and ease of tune-up. The only transmitter tuning requirement is re-peaking of the final amplifier plate when large frequency changes are made.
11. Shaped, blocked-grid keying combined with linear circuitry and extreme frequency stability insure unexcelled CW performance.
12. A separate front panel control provides for smooth injection of carrier for excellent quality AM operation and adjustable CW output.
13. Accessory connector is provided for connection and control of external linear amplifier and/or separate receiver.
14. Each Venus is equipped with a high quality Clegg model 629 high output, shielded microphone matched to the transmitter input for maximum talk power.

C. Specifications

1. Electrical

a) Transmit

Frequency Range:	49,975 to 50,475 KC, Standard (other ranges available on special order).
Power Ratings:	85 watts PEP input - all modes (AM, SSB, and CW.)
SSB Performance (9 MC lattice filter)	Unwanted sideband down more than 50 db at 1000 cycles. Carrier suppression greater than 56 db. Distortion products down more than 30 db at full ratings.
Frequency Stability:	Less than 500 cycle warmup drift after first five minutes. Less than 100 cycle/hour drift after warmup.

b) Receive

Frequency Range:	Same as TRANSMIT
Frequency Stability:	Same as TRANSMIT
Sensitivity:	.25 μ V for 6 db S/N on AM .1 μ V for 6 db S/N on SSB
Selectivity:	2.7 KC at 6 db, less than 6 KC at 50 db.
Spurious Responses:	Images and IF leak through down more than 60 db.
Overload Characteristics:	Less than 5% cross modulation results from any two signals separated by more than 20 KC if stronger signal is less than 2 MV across 50 ohm input.
AVC Characteristics:	Less than 10 db change in AF output for input change from 1 μ V to 400 μ V (52 db). Fast attack, panel selectable release times of .15 or 1.2 seconds.
AF Power Output to Speaker:	More than 2 watts at 3.2 ohms.

c) Power Supply

Power requirements are met by the Clegg Model 416A, 115 Volts AC, 60 cps input Power Supply/speaker combination (as well as by other commercially available Power Supply/speaker packages. (See Section II, Installation)

2. Tube Lineup (See Figure 2)

	<u>Tube No.</u>	<u>Tube Type</u>	<u>Receive</u>	<u>Transmit</u>
<i>new</i>				
<i>1/17/72</i>	V1	6CW4	RF Amp	--
<i>1/17/72</i>	V2	6EH7	1st Mixer	--
<i>1/17/72</i>	V3	6EH7	2nd Mixer	--
	V4	12BA6	9 MC amp	--
	V5	12BE6	3rd Mixer	--
	V6	12BA6	455 KC IF	--
	V7A	12AL5/2	AM DET	--

II. INSTALLATION

A. Unpacking

The Venus has been packed with adequate internal carton bracing and cushioning to withstand normal handling in shipment on common carriers. Examine the carton exterior for signs of severe damage (crushing, piercing, etc.) In the event of obvious serious damage, examine the equipment carefully to determine the extent of internal damage, save packing material and make claim against transportation company.

Check all front panel controls for freedom of action and observe that all tubes and crystals are firmly seated in their sockets. Complete and mail the equipment registration card.

Many customers have found that saving the shipping carton and the internal cushioning is a great convenience in the event of subsequent need for reshipment or prolonged storage.

B. Installation (Fixed Station)

1. Power Supply/Speaker combination

Clegg Model #416A or 416D or suitable commercial supply furnishing:

- +275 volts at 125 Ma
- +650 to 750 volts at 150 Ma
- 100 volts at 10 Ma
- 12.6 volts at 5.5 ampere AC or DC with built in
- 4 ohm speaker

2. Antenna Connection

Type UHF (SO-239) to match with PL259 male plug. The Venus is designed for use with 50 to 75 ohm loads. Typical of all VHF equipment, its performance is very much influenced by the antenna system. A well matched three element beam located at least 20 feet above ground with RG-8AU or better cable, is considered minimum for satisfactory performance. For mobile operation, a carefully matched "halo" will be found satisfactory.

3. Speaker

Self contained and automatically connected with Clegg Model 416A power supply. Speaker connections are pins #5 (GRD) and #7 on power supply Jones plug. A speaker of 3 to 6 ohms impedance should be used.

4. Microphone

The Clegg audio circuits and the Model 626 microphone furnished with the Venus have been carefully matched for maximum performance. Such other microphones as the Electro Voice #633, Astatic D-104 and similar high impedance units will provide satisfactory operation where a desk microphone is desired. Since normal TRANSMIT-RECEIVE switching of the Venus for SSB or AM is performed only via the PTT control system, any alternate microphone must be of the type that provides PTT operation. The microphone employs a three circuit plug wired per figure 3 below:

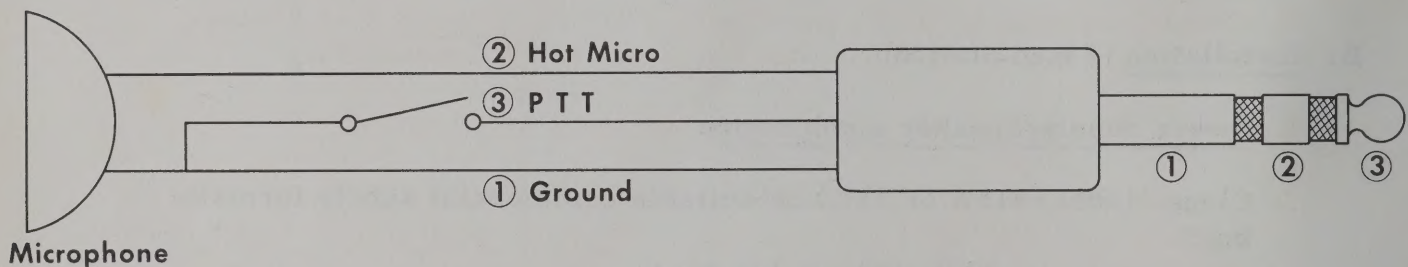


FIG. 3

5. Key Jack is of the RCA or phono type and is located on the rear apron of the chassis. A matching plug is furnished (See Section III, A5).
6. Auxiliary connectors are provided for antenna switching and connection and control of an auxiliary linear amplifier and/or an external separate receiver.

RCA phono connectors adjacent to the antenna connector and the three circuit terminal strip adjacent to the power plug at the rear of the unit per figure 4 provide these facilities.

III. OPERATION

A. Initial Receiver Operation

1. Set controls as follows: (See Figure 1)
 - a) RECEIVER AUDIO to AC OFF position
 - b) SPEECH GAIN slightly clockwise (off CW position)
 - c) CARRIER BALANCE to 12 o'clock
 - d) RECEIVER RF GAIN to maximum clockwise
 - e) CARRIER LEVEL to full counter-clockwise position (past switch)
 - f) RECEIVER OFFSET to 0
 - g) AVC to fast
 - h) DETECTOR to CW-SSB
 - i) NOISE LIMITER to OFF
 - j) AMPLIFIER PLATE TUNE and LOAD to 12 o'clock
2. Connect interconnecting cable from power supply/speaker cabinet to Jones plug at rear.
3. Connect antenna to UHF coaxial plug at rear. Be sure that jumpers are firmly seated in phono plugs adjacent to ANT connector.
4. Insert microphone plug from Model 626 into MIKE jack.
5. Connect KEY to KEY JACK at rear. IF CW IS NOT CONTEMPLATED or KEY and CABLE is not available, the phono plug supplied with the unit must be shorted and inserted in the key jack before proceeding with tuneup.
6. Connect AC cable from power supply to 110-120 volt, 60 cycle source.
7. Turn RECEIVER AUDIO to about 9 o'clock and observe that dial lamps light. S meter will normally go to full scale and return to near zero as unit warms up.
8. Receiver is now in operation and performs in the conventional manner. It is suggested that some tuning of the receiver be done on different signals before proceeding with transmitter operation. The following notes will be helpful:
 - a) AVC: Use FAST AVC while tuning and listening under noisy band conditions. SLOW AVC will be found desirable in most SSB and CW operation.

- b) Noise Limiter: The Noise Limiter will be found to behave quite differently between the AM and CW and SSB Modes. On AM, the operation is automatic and is simply activated by advancing the panel control off the switch position. On CW and SSB, the limiter is manually controlled by slowly advancing the control in a clockwise direction until most effective noise limiting (consistent with acceptable distortion) is attained.
- c) Tuning: The narrow IF band width of the VENUS will accommodate only one sideband of a voice station. On SSB, the internal oscillators are factory adjusted for Upper Side Band reception. AM stations should be tuned so that either upper or lower sideband is received. This can best be established by tuning slightly to either side of the maximum S meter reading. When an interfering signal exists on one sideband, it will be found that the other sideband can be copied without interference.
- d) Receiver RF Gain: The Receiver RF Gain will normally be set at maximum but it may be found desirable to reduce gain when working strong local CW or SSB stations.
- e) S Meter: The S Meter is calibrated so that 24 microvolts input produces an S9 meter reading, with each S unit indicating approximately 6 db. That is, each S unit represents an increase of 2 times in input signal voltage or 4 times in input signal power. A 1 μ V signal will normally be approximately S4-1/2; A 750 μ V signal will produce a 30 db over S9 reading.
- f) Frequency Display: Dial readout and accuracy will be within 2 KC over the range from 50,050 and 50,250 KC and better than 4 KC at any other point. The vernier dial window reads directly in kilocycles over the range from 50,000 and 50,350 KC. When aligned at the factory, the dial reading error at 50,100 KC is less than 500 cycles. Reset to less than 1 KC is possible over the full range.
- g) Receiver Offset: This control may be considered as an electrical vernier or bandspread control having a calibrated range of ± 1.5 KC. The VENUS is designed to include two such controls which are automatically switched between receive and transmit. The TRANSMITTER OFFSET control, located at the rear of the unit affects transmitting frequency only, whereas the RECEIVER OFFSET control affects receiver tuning only. When properly calibrated, with the RECEIVER OFFSET at 0, the transmitter and received frequencies will be identical. If the station being received drifts in frequency or if a "round table" of several stations are being worked, it is possible with the

RECEIVER OFFSET control to maintain proper receiver tuning without changing transmitting frequency.

- h) S Meter Adjust: The S Meter adjustment control located on the rear chassis apron should be adjusted for zero meter reading after the unit has been warmed up for 15 minutes or more with antenna disconnected and the RF gain set at minimum.
- 9. The VENUS may be adapted for use as a conventional crystal controlled 50 to 51 MC converter with 14 to 15 MC output. Normal transceiver operation is unaffected. A phono type receptacle (identical to that provided for the KEY) should be added in the hole provided adjacent to the three terminal strip on the rear chassis apron. A 1.5 pf disc ceramic capacitor should be connected between pin #2 of V3 (6EH7) and the hot terminal of the phono receptacle. A 20" to 30" length of RG-58 should be used between this output and the antenna input of a 14 MC communications receiver. Muting of the 14 MC receiver can be accomplished by use of the relay contacts on the rear apron terminal strip.
- 10. The foregoing modification permits the use of a visual panoramic display on any model visual bandscanning device designed or adaptable to 14 MC input. Display bandwidth will be approximately 400 KC centered at 50.2 MC.

B. Initial Transmitter Operation

- 1. The transmitter functions of the VENUS can be activated by either depressing the "push to talk" button on the microphone (for AM or SSB) or turning the SPEECH GAIN control completely counterclockwise to the CW switched position. The CW position in conjunction with the CARRIER control provides a convenient "tune-up" facility. TO UTILIZE THIS FACILITY IT IS NECESSARY THAT A SHORTED PLUG OR A CLOSED TELEGRAPH KEY BE CONNECTED AT THE KEY JACK.
- 2. Set controls as follows:
 - a) MAIN TUNING DIAL to 50,150 KC
 - b) CARRIER BALANCE at 12 o'clock
 - c) CARRIER LEVEL to full counterclockwise position (past switch).
 - d) AMPLIFIER PLATE TUNE and LOAD to 12 o'clock.
 - e) SPEECH GAIN switch to CW position (full ccw).
- 3. Adjust BIAS control on rear apron so 0-200 Ma CATHODE CURRENT Meter reads between 25 and 30 Ma.

4. Adjust CARRIER BALANCE control so both meters read minimum.
5. Repeat step 3 (BIAS adjustment) if necessary.
6. Insert carrier by means of CARRIER LEVEL control. Advance control to full clockwise position. This control is unmarked on Venus serial numbers 608001 to approximately 608050 and is located below the CARRIER BALANCE control. On serial numbers above 608050, the positions of the CARRIER LEVEL and CARRIER BALANCE controls are inverted and marked as shown in Figure 1.
7. Adjust both AMPLIFIER PLATE TUNE and LOAD CONTROLS for maximum indication on upper meter (S meter). The two controls will be found to interact, but with some small practice, it will be found that the TUNE control will principally affect the upper meter (RELATIVE OUTPUT) and the LOAD control will affect cathode current. The correct final adjustment will be that which yields a maximum reading on the top meter and a dip or minimum reading on the lower meter. If CATHODE CURRENT exceeds 130 Ma, the CARRIER LEVEL control should be backed down.

With a matched 50 ohm antenna load it should be possible to obtain nearly full scale reading on the output (upper) meter with approximately 120 Ma of CATHODE CURRENT. Tuned in this manner, the VENUS is ready for CW operation.

8. To operate on SSB, the CARRIER LEVEL control is turned completely back (counter clockwise) past the switch position. The CARRIER BALANCE control is then adjusted carefully for zero reading on the output meter. (This is easier to observe if the AVC switch is in the FAST position). This adjustment should be made by activating the transmitter either with the CW position on the SPEECH GAIN control or by using the push to talk microphone switch. In the latter case, it is important that the SPEECH GAIN be at minimum (not in CW Position). After balancing the carrier as above the SPEECH GAIN can be advanced while talking into the microphone until both CATHODE CURRENT meter and OUTPUT meter both move up scale.
9. The preferred method for adjusting the SPEECH GAIN setting of any SSB transmitter is with an oscilloscope. However, in the absence of this instrument, the SPEECH GAIN can be adjusted quite satisfactorily by observation of the two panel meters. During normal speech, with average male voice and with the AVC in the FAST position, the CATHODE CURRENT meter will normally swing up to 55 or 60 Ma and the OUTPUT meter will hover just above midscale. On sustained tones whistled into the microphone,

the meters will show about double these readings. ADVANCING THE SPEECH GAIN BEYOND THE OPTIMUM POINT CAN CAUSE OBJECTIONABLE DISTORTION PRODUCTS TO APPEAR ON THE "UNWANTED SIDEBAND".

10. The VENUS features broadbanded circuits throughout the exciter and driver stages. When moving in frequency, it is only necessary to readjust the AMPLIFIER PLATE TUNE control for maximum output. In fact, this adjustment need not be made unless the transmitter frequency is moved more than 150 KC.
11. The final amplifier stage can be disabled by switching the RECEIVER RF GAIN fully counter clockwise (past the switch detent). This may be found convenient for monitoring and/or "talking one's self on frequency" when using on auxiliary receiver.
12. The VENUS is operable as an AM transmitter for contacting stations not equipped to copy suppressed carrier transmissions.

Sufficient carrier should be inserted by means of the CARRIER LEVEL control to produce an indicated CATHODE CURRENT of 60 Ma. The SPEECH GAIN control should then be adjusted so that a very slight upward deflection of CATHODE CURRENT and RELATIVE OUTPUT occurs under normal voice levels.

Operation otherwise is identical with suppressed carrier SSB.

OPERATION WITH EXTERNAL RECEIVER AND LINEAR AMPLIFIER

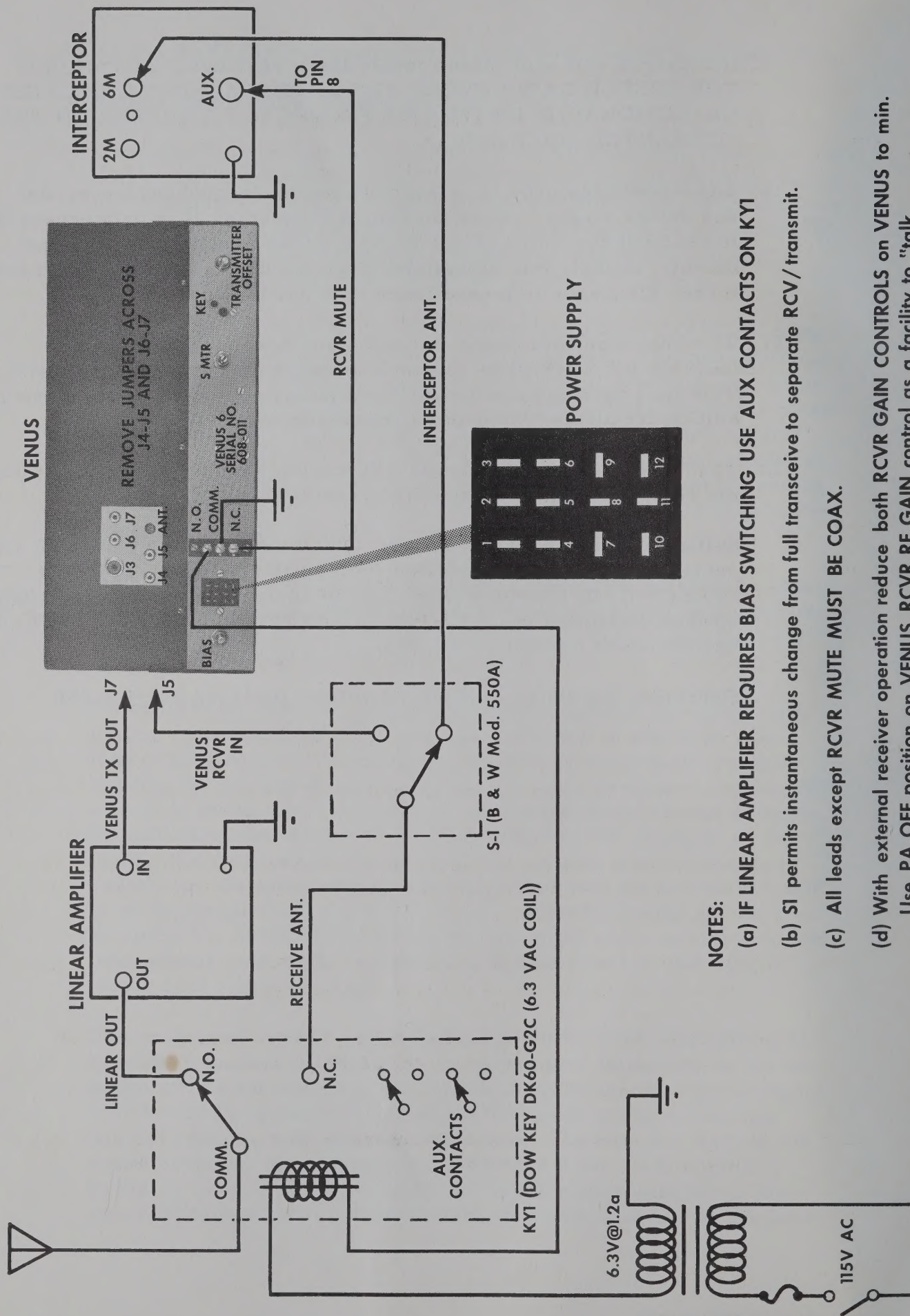


FIG. 4

C. Maintenance Adjustments

1. TRANSMITTER OFFSET ADJUSTMENT (Control located on rear apron, See Figure 4). Adjustment of this control which is preset at the factory, should not normally be necessary unless several reliable reports indicate that your transmitter and receiver are not on exactly the same frequency.

The simplest procedure for making this adjustment is to engage in a three way QSO with two strong local SSB stations who are both on the same frequency. With the RECEIVER OFFSET control set exactly on 0, tune the two stations in for best intelligibility and most natural sound. Ask for a report as to whether your signal is high or low in frequency. (Your voice will sound excessively low if you are too low; it will sound excessively high pitched if you are high in frequency). Rotate the TRANSMITTER OFFSET control in small increments using push to talk break in to get a report for each increment. Continue this process until both stations report that you are on frequency.

2. DIAL CALIBRATION. The dial calibration of the VENUS has been factory adjusted to meet or exceed specifications. If, due to replacement of tubes or extremely rough handling, it becomes necessary to correct dial calibration, the following procedure should be followed:
 - a) Remove SNAP-PLUG from left side of cabinet directly behind S meter.
 - b) Observe that there are two trimmer adjustments accessible through this hole on the side of the VLO (Variable Local Oscillator) compartment. The adjustment toward the front is L15 and the one to the rear is C9.
 - c) A reliable frequency standard at two known frequencies near 50.1 MC and 50.3 MC is required. Set RECEIVER OFFSET to 0, DETECTOR to CW/SSB.
 - d) Capacitor C9 should be adjusted so that dial calibration is exactly correct on the lower of the two frequencies.
 - e) Tune receiver to zero beat on the higher frequency. If the dial reading is in error by more than 2 KC, readjust C9 for a correct dial reading.
 - f) Return to lower frequency standard and reset L15 slug for correct reading at that frequency.

- g) Repeat steps (e) and (f) as many times as necessary to achieve correct dial reading at both frequencies. This process will be hastened somewhat if each adjustment of L15 or C9 is overdone slightly each time. That is, if a 3 KC error exists on step 6, a 4 KC correction should be performed.

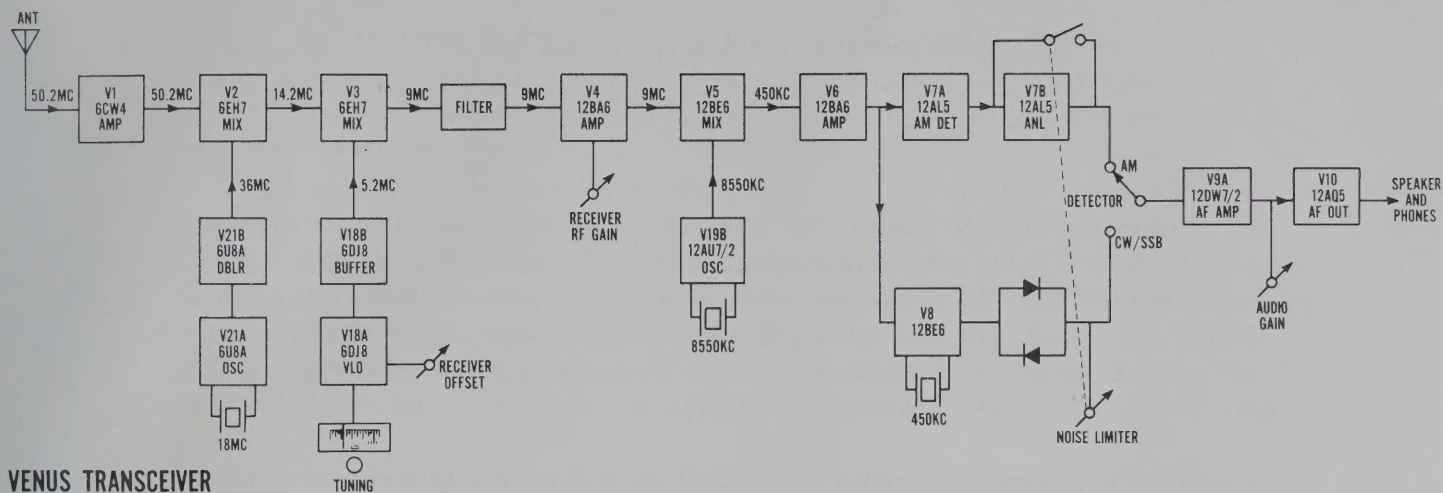
3. CARRIER BALANCE. The VENUS is capable of providing a stable carrier suppression in excess of 50 db. Normally full balance of carrier can be achieved with the CARRIER BALANCE panel control. It may become desirable, after several hundred hours of operation, to adjust the Balanced Modulator quadrature balance control C4 located on top of the chassis immediately in front of V12. The procedure is as follows:

- a) Tune both the VENUS and a stable 6 meter receiver to any frequency between 50.1 and 50.3 MC. Operate the VENUS in the CW position (being certain to close the KEY JACK circuit) and with the LEVEL control switched into the 0 position, adjust the CARRIER BALANCE control for minimum S meter reading on the auxiliary receiver. By means of a long (7") and thin (3/32") screwdriver inserted through one of the cabinet perforations adjust capacitor C4. It will be found that small adjustment of C4 performed in conjunction with readjustment of the panel BALANCE control will permit reduction of the residual carrier to an almost undetectable level. When performed with care and patience it is possible to achieve a suppressed carrier level down more than 70 db below maximum peak output.

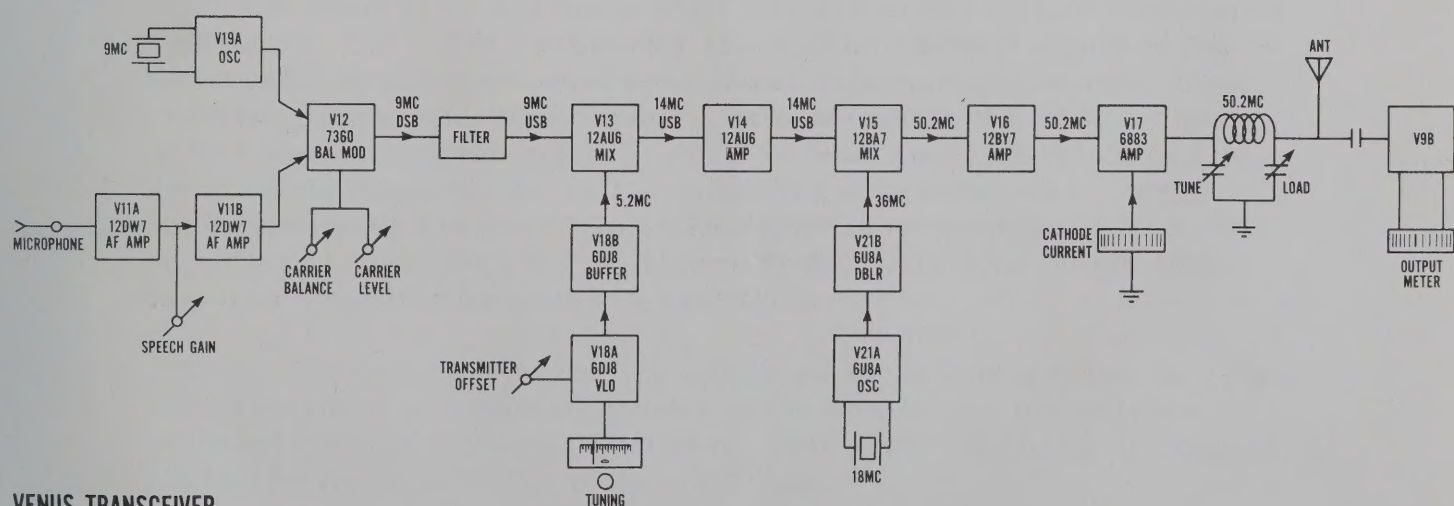
D. Use of Accessory Equipment

The generous use of plugs, spare terminals, patch cords, etc. permits the use of many accessories and operating aids with the VENUS. Most of these provisions are self-evident from examination of the schematic diagram.

A detailed application bulletin will be prepared in the future and distributed to all registered VENUS owners. In the meantime, we invite your specific inquiries regarding control of linear amplifiers, separate receivers and/or converters, etc.



VENUS TRANSCEIVER
RECEIVER FUNCTIONS



VENUS TRANSCEIVER
TRANSMITTING FUNCTIONS

IV. THEORY OF OPERATION

(Refer to Figure 5, BLOCK DIAGRAMS)

A. Receive Mode Functions

Incoming signals at 50 to 50.5 MC are amplified by V1 and converted to 14 MC in V2 utilizing a 36 MC crystal derived signal from V21. The coupling between V2 and V3 is broadbanded for a 600 KC bandwidth. V3 is a mixer stage whose injection signal is derived from the 5.0 to 5.5 MC variable local oscillator (VLO). Output of V3 is at 9 MC. A crystal lattice filter at 9 MC provides approximately 3 KC selectivity.

The filter output is amplified in V4 whose gain is adjustable by the RF Gain control. The amplified 9 MC output of V4 is converted to 450 KC in mixer stage V5 and this signal is amplified by V6. V7A is an AM detector and AVC diode. V7B is a peak limiter for noise reduction on AM. V8 is a product detector with 450 KC crystal controlled injection. Semiconductor diodes are employed as a manually controlled peak noise limiter for CW and SSB. Two stages of audio amplification are furnished by V9A and V10.

V9B functions as a non-linear VTVM monitoring the AVC voltage applied to V5 and V6. Panel control of the AVC discharge time constant permits selection of fast or slow AVC release time.

B. Transmit Mode Functions

9 MC RF from V19A and audio from V11 are both supplied to balanced modulator, V12. The resultant 9 MC double sideband signal is fed to the crystal lattice filter where the lower sideband is removed. The remaining upper sideband signal is heterodyned to the 14 MC region in V13 whose injection signal is derived from the 5 MC VLO. As in the receiver section, the 14 MC amplifier is broadbanded. After amplification in V14 the 14 MC USB signal is heterodyned in V15 to 50 MC, V21 furnishing the necessary 36 MC injection. 50 MC USB output is amplified by both V16 and V17.

V9B and the related S meter are employed as an output meter on transmit. The scale is expanded greatly at the bottom end to facilitate accurate carrier balance adjustment. This scale expansion is accomplished by the VARISTOR in the AVC line.

SECTION V

VOLTAGE AND RESISTANCE TABLE

SET-UP

The measurements given in the Voltage Chart opposite are accurate to $\pm 10\%$. They are based upon an input voltage of 115 VAC 60 cycles to a power supply capable of delivering -80 VDC at 10 MA., 12.6 VAC at 6 Amps, +280 VDC at 130 MA. and +750 VDC at 130 MA. Properly connected to the power receptacle (J1) on the rear of the VENUS. A VOM with a sensitivity of 20 K ohms per volt DC or better should be used. The control settings are as follows:

RECEIVE

1. SPEECH GAIN -- Switched clockwise and set to minimum.
2. CARRIER LEVEL -- Switched counter-clockwise to "0".
3. BALANCE CONTROL -- Set for best carrier balance in transmit.
4. RECEIVER RF GAIN -- Full clockwise (V4 voltages vary with the control settings).
5. RECEIVER OFFSET -- At "0".
6. AVC to FAST.
7. DETECTOR -- To AM DET.
8. DETECTOR -- To SSB-CW to measure V8 voltages only.
9. NOISE LIMITER -- To "OFF".
10. AMPLIFIER PLATE -- Tune and Load controls set to any position.
11. RECEIVER AUDIO -- Switched clockwise, thus tuning the VENUS on.
12. VENUS main tuning dial to 50.2 MCS.

TRANSMIT

1. Tune up the transmitter section per previous instructions for SSB operation into a suitable load.
2. Switch the Speech Gain fully counter-clockwise to turn the transmitter on when making measurements.
3. Be sure Carrier Level is set to "0".

VENUS VOLTAGE TABLE

TUBE		1	2	3	4	5	6	7	8	9	10	11
V1 6CW4	R T	—	108 0	—	GND	—	—	—	.63 0	—	6.3Vac	
V2 6EH7	R T	4.3 0	0 -50	NC	12.6Vac	6.3Vac	GND	190 0	82 0	4.3 0		
V3 6EH7	R T	.64 0	0	NC	GND	6.3Vac	GND	192 0	25 0	.64 0		
V4 12BA6	R T	0	GND	GND	12.6Vac	192 0	87 to 195 0	1.5 to 27 0 to 17				
V5 12BE6	R T	0	1.2 0	12.6Vac	GND	183 0	88 0	0				
V6 12BA6	R T	0	GND	GND	12.6Vac	182 0	95 0	1.7 0				
V7 12AL5	R T	-.3 -.17	-.54 -.53	GND	12.6Vac	GND	GND	-.31 -.16				
V8 12BE6	R T	-.7 0	.8 0	GND	12.6Vac	165 0	38 0	0				
V9 12DW7	R T	65 83	0	.75 .85	12.6Vac	GND	95 0	0	.765 0	NC		
V10 12AQ5	R T	NC	10 0	12.6Vac	GND	265 305	195 0	0				
V11 12DW7	R T	0 160	0	0 7.15	12.6Vac	GND	0 160	0	0 1.49	NC		
V12 7360	R T	33 4	176 172	0	6.3Vac	GND	140 142	147 150	25 27	25 26		
V13 12AU6	R T	-75 -47	GND	12.6Vac	GND	0 232	0 215	0 5.2				
V14 12AU6	R T	0 Note 1	GND	12.6Vac	GND	0 230	0 195	0 2.75				
V15 12BA7	R T	0 80	-76 0	0 1.17	GND	12.6Vac	GND	0	GND	0 225		
V16 12BY7	R T	0 4.1	-37 0	GND	GND	12.6Vac	NC	285 280	285 210	GND		
V17 6883	R T	0	12.6Vac	0 237	0	-90 -55	0	GND	GND			
V18 6DJ8	R T	41	-1	GND	GND	6.3Vac	80	0	2.15	GND		
V19 12AU7	R T	33 0	-1.6 0	GND	12.6Vac	12.6Vac	0 26	0 -1	GND	6.3Vac		
V20 OA2	R T	150	GND	NC	NC	150	NC	NC				
V21 6U8A	R T	70	-.75 -.7	142 160	12.6Vac	6.3Vac	183 220	GND	GND	-.6 1.55		
J1	R T	0	0	-100	12.6Vac	GND	GND	0	NC	275	NC	750

NOTE:

1 TRANSMIT POSITION V14, PIN1—KEY DOWN 0VOLTS
—KEY UP -17 VOLTS

SECTION VI

TRANSCEIVER, VENUS 6 METER

PARTS LIST

ITEM	DESCRIPTION	PART NUMBER	ITEM	DESCRIPTION	PART NUMBER
C1	CAPACITOR, VARIABLE, 8-50 pf, N750	116-107	C81	CAPACITOR, TUBULAR, MYLAR, .047 MFD, 10%, 400 V	105-308
C2	CAPACITOR, VARIABLE, 5-25 pf, NPO	116-108	C82	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C3	CAPACITOR, VARIABLE, 5-25 pf, NPO	116-108	C83	CAPACITOR, TUBULAR, MYLAR, .1 MFD, 10%, 400 V	105-304
C4	CAPACITOR, VARIABLE, 2.3-14.2 pf, DIFFERENTIAL	110-115	C84	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C5	CAPACITOR, VARIABLE, 0.5-5 pf	116-001	C85	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C6	CAPACITOR, VARIABLE, 5-25 pf, NPO	116-108	C86	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C7	CAPACITOR, VARIABLE, 4-16 pf	110-003	C87	CAPACITOR, DIPPED SILVER MICA, 82 pf, 5%, 500 V	104-120
C8	CAPACITOR, VARIABLE, 100 pf	110-108	C88	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C9	CAPACITOR, VARIABLE, 1.8-8.7 pf	110-004	C89	CAPACITOR, DISC, CERAMIC, 47 pf, NPO, 5%, 1 KV	100-120
C10	CAPACITOR, VARIABLE, 5-50 pf	110-013	C90	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C11	CAPACITOR, ELECTROLYTIC, 4 MFD, 500 V	107-004	C91	CAPACITOR, DISC, CERAMIC, 56 pf, NPO, 5%, 1 KV	100-121
C12A	CAPACITOR, ELECTROLYTIC, 40 MFD, 350 V	108-102	C92	CAPACITOR, DISC, CERAMIC, 27 pf, NPO, 5%, 1 KV	100-117
C12B	CAPACITOR, ELECTROLYTIC, 250 MFD, 25 V	108-102	C93	CAPACITOR, TUBULAR, CERAMIC, 15 pf, N750, $\pm 2\%$	105-044
C13	CAPACITOR, ELECTROLYTIC, 10 MFD, 15 V	107-006	C94	CAPACITOR, DISC, CERAMIC, 15 pf, NPO, 5%, 1 KV	100-114
C14	CAPACITOR, ELECTROLYTIC, 10 MFD, 15 V	107-006	C95	CAPACITOR, SILVER MICA, 150 pf, $\pm 1\%$, 500 V	103-124
C15	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106	C96	CAPACITOR, SILVER MICA, 1300 pf, $\pm 1\%$, 500 V	103-110
C16	CAPACITOR, DISC, CERAMIC, 4.7 pf, NPO, ± 0.25 pf, 1 KV	100-108	C97	CAPACITOR, SILVER MICA, 1300 pf, $\pm 1\%$, 500 V	103-110
C17	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C98	CAPACITOR, DISC, CERAMIC, 4.7 pf, NPO, ± 0.25 pf, 1 KV	102-043
C18	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C99	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	100-108
C19	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C100	CAPACITOR, TUBULAR, MYLAR, .33 MFD, 125 V	105-306
C20	CAPACITOR, DISC, CERAMIC, 2.2 pf, NPO, ± 0.25 pf, 1 KV	100-104	C101	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C21	CAPACITOR, DISC, CERAMIC, 15 pf, NPO, 5%, 1 KV	100-114	C102	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C22	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106	C103	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C23	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C104	CAPACITOR, DISC, CERAMIC, 22 pf, NPO, 5%, 1 KV	100-115
C24	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C105	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C25	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C106	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C26	CAPACITOR, DISC, CERAMIC, 1.0 pf, NPO, ± 0.25 pf, 1 KV	100-100	C107	CAPACITOR, DISC, CERAMIC, 12 pf, NPO, 5%, 1 KV	100-113
C27	CAPACITOR, DISC, CERAMIC, 12 pf, NPO, $\pm 5\%$, 1 KV	100-113	C108	CAPACITOR, DISC, CERAMIC, 22 pf, NPO, 5%, 1 KV	100-115
C28	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106	C109	CAPACITOR, DISC, CERAMIC, 0.1 MFD, +80-20%, 25 V	102-065
C29	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C110	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C30	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C111	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C31	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C112	CAPACITOR, DISC, CERAMIC, .005 MFD, +80-20%, 1 KV	102-050
C32	CAPACITOR, DISC, CERAMIC, 27 pf, NPO, 5%, 1 KV	100-117	C113	CAPACITOR, DISC, CERAMIC, 1.0 pf, NPO, ± 0.25 pf, 1 KV	100-100
C33	CAPACITOR, DISC, CERAMIC, 22 pf, NPO, 5%, 1 KV	100-116	C114	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C34	CAPACITOR, DISC, CERAMIC, 12 pf, NPO, 5%, 1 KV	100-113	C115	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C35	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C116	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C36	CAPACITOR, DISC, CERAMIC, 33 pf, NPO, 5%, 1 KV	100-118	C117	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C37	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C118	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106
C38	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C119	CAPACITOR, DISC, CERAMIC, 1.0 pf, NPO, ± 0.25 pf, 1 KV	100-100
C39	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C120	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C40	CAPACITOR, DISC, CERAMIC, 27 pf, NPO, 5%, 1 KV	100-117	C121	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C41	CAPACITOR, DISC, CERAMIC, 27 pf, NPO, 5%, 1 KV	100-117	C122	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C42	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C123	CAPACITOR, DISC, CERAMIC, 1.5 pf, NPO, ± 0.25 pf, 1 KV	100-102
C43	CAPACITOR, DISC, CERAMIC, 6.8 pf, NPO, ± 0.25 pf, 1 KV	100-110	C124	CAPACITOR, DISC, CERAMIC, 56 pf, NPO, 5%, 1 KV	100-121
C44	CAPACITOR, DISC, CERAMIC, 47 pf, NPO, 5%, 1 KV*	100-120	C125	CAPACITOR, DISC, CERAMIC, 56 pf, NPO, 5%, 1 KV	100-121
C45	CAPACITOR, DISC, CERAMIC, 56 pf, NPO, 5%, 1 KV	100-121	C126	CAPACITOR, DISC, CERAMIC, 6.8 pf, NPO, ± 0.25 pf, 1 KV	100-110
C46	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C127	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C47	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C128	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C48	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C129	CAPACITOR, DISC, CERAMIC, 15 pf, NPO, 5%, 1 KV	100-114
C49	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C130	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106
C50	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C131	CAPACITOR, DISC, CERAMIC, 2.2 pf, NPO, ± 0.25 pf, 1 KV	100-104
C51	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C132	CAPACITOR, TUBULAR, MYLAR, .68 MFD, $\pm 10\%$, 125 V	105-037
C52	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C133	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C53	CAPACITOR, DISC, CERAMIC, 150 pf, 10%, 1 KV	101-000	C134	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C54	CAPACITOR, DISC, CERAMIC, 150 pf, 10%, 1 KV	101-000	C135	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C55	CAPACITOR, DISC, CERAMIC, 3.3 pf, NPO, ± 0.25 pf, 1 KV	100-106	C136	CAPACITOR, DISC, CERAMIC, 470 pf, +80-10%, 1 KV	101-003
C56	CAPACITOR, DISC, CERAMIC, 12 pf, NPO, 5%, 1 KV	100-113	C137	CAPACITOR, DISC, CERAMIC, 470 pf, +80-10%, 1 KV	101-003
C57	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056	C138	CAPACITOR, DISC, CERAMIC, 47 pf, NPO, 5%, 1 KV	100-120
C58	CAPACITOR, DISC, CERAMIC, 33 pf, NPO, 5%, 1 KV	100-118	C139	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C59	CAPACITOR, DISC, CERAMIC, 150 pf, 10%, 1 KV	101-000	C140	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C60	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C141	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C61	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C142	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C62	CAPACITOR, DISC, CERAMIC, 470 pf, JF, $\pm 10\%$, 1 KV	101-003	C143	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C63	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C144	CAPACITOR, DISC, CERAMIC, 470 pf, $\pm 10\%$, 1 KV	101-003
C64	CAPACITOR, DISC, CERAMIC, .001 MFD, +80-20%, 1 KV	102-039	C145	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043
C65	CAPACITOR, TUBULAR, MYLAR, .15 MFD, 10%, 125 V	105-305	C146	CAPACITOR, DISC, CERAMIC, 15 pf, NPO, 5%, 1 KV	100-114
C66	CAPACITOR, DISC, CERAMIC, .005 MFD, +80-20%, 1 KV	102-050	C147	CAPACITOR, SILVER MICA, 470 pf, 20%, 2.5 KV	103-108
C67	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C148	CAPACITOR, DIPPED SILVER MICA, 100 pf, 5%, 2.5 KV	104-130
C68	CAPACITOR, DISC, CERAMIC, 2.2 MFD, +80-20%, 3 V	102-062	C149	CAPACITOR, DIPPED SILVER MICA, 82 pf, 5%, 2.5 KV	104-140
C69	CAPACITOR, DISC, CERAMIC, .001 MFD, +80-20%, 1 KV	102-039	C150	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C70	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043	C151	CAPACITOR, DISC, CERAMIC, .01 MFD, +80-20%, 500 V	102-054
C71	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 1 KV	102-056	C152	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056
C72	CAPACITOR, TUBULAR, MYLAR, .68 MFD, 10%, 125 V	105-307	C153	CAPACITOR, TUBULAR, MYLAR, .047 MFD, $\pm 10\%$, 400 V	105-308
C73	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043			
C74	CAPACITOR, DISC, CERAMIC, .02 MFD, +80-20%, 500 V	102-056			
C75	CAPACITOR, DISC, CERAMIC, 2200 pf, +80-20%, 1 KV	102-043			
C76	CAPACITOR, DISC, CERAMIC, 47 pf, NPO, 5%, 1 KV	100-120			
C77	CAPACITOR, DISC, CERAMIC, 2.2 MFD, +80-20%, 3 V	102-062			
C78	CAPACITOR, DISC, CERAMIC, .001 MFD, +80-20%, 1 KV	102-039			
C79	CAPACITOR, TUBULAR, MYLAR, .1 MFD, 10%, 400 V	105-304			
C80	CAPACITOR, DISC, CERAMIC, 47 pf, NPO, 5%, 1 KV	100-120			

* NOMINAL VALUE, ADJUSTED AT FACTORY.

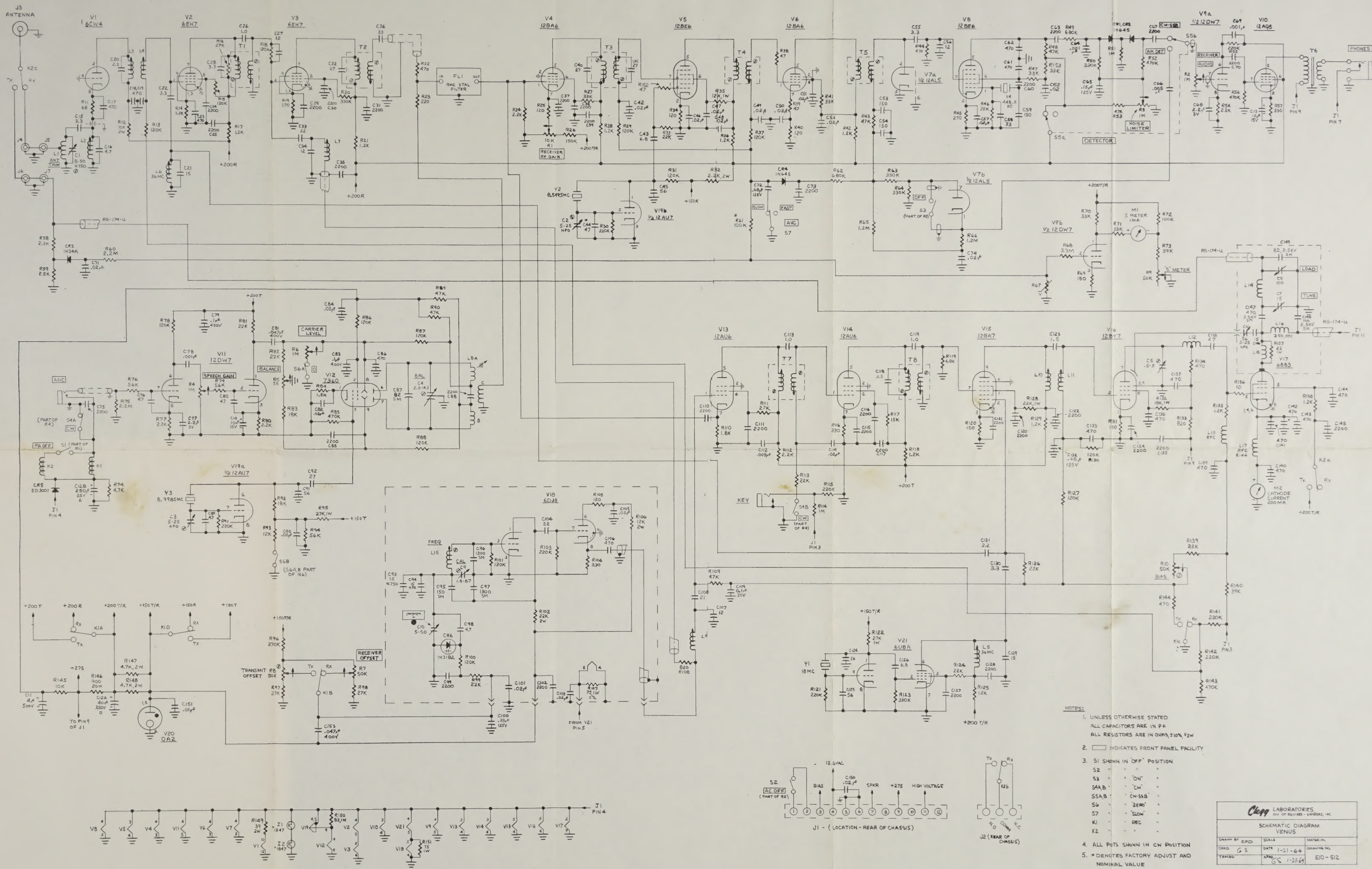
PARTS LIST (Cont'd.)

ITEM	DESCRIPTION	PART NUMBER	ITEM	DESCRIPTION	PART NUMBER
Y1	CRYSTAL, 18 MC	250-014	R1	RESISTOR, VARIABLE, 10 K, 30%, 1/2 W	245-002
Y2	CRYSTAL, 8.5495 MC	250-008	R2	RESISTOR, VARIABLE, 1 MEG, 30%, 1/2 W	245-001
Y3	CRYSTAL, 8.9985 MC	250-009	R3	RESISTOR, VARIABLE, 1 MEG, 30%, 1/2 W	245-001
Y4	CRYSTAL, 448.5 KC	259-003	R4	RESISTOR, VARIABLE, 1 MEG, 30%, 1/2 W	245-001
FL1	CRYSTAL, 9 MC CRYSTAL LATTICE FILTER	265-001	R5	RESISTOR, VARIABLE, 5 K, 30%, 1/2 W	240-005
			R6	RESISTOR, VARIABLE, 1 MEG, 30%, 1/2 W	245-001
			R7	RESISTOR, VARIABLE, 50 K, 30%, 1/2 W	240-006
			R8	RESISTOR, VARIABLE, 50 K, 30%, 1/2 W	240-006
			R9	RESISTOR, VARIABLE, 50 K, 30%, 1/2 W	240-006
			R10	RESISTOR, VARIABLE, 50 K, 30%, 1/2 W	240-006
			R11	RESISTOR, FIXED, COMPOSITION, 68 ohm, 10%, 1/2 W	223-680
			R12	RESISTOR, FIXED, COMPOSITION, 10 K, 10%, 1/2 W	227-103
			R13	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
CR1	DIODE, SILICON, TI56	142-001	R14	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122
CR2	DIODE, SILICON, TI56	142-001	R15	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
CR3	DIODE, GERMANIUM, IN34A	141-001	R16	RESISTOR, FIXED, COMPOSITION, 27 K, 10%, 1/2 W	223-273
CR4	DIODE, SILICON, TI56	142-001	R17	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122
CR5	DIODE, SILICON, ED3001S	142-003	R18	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
CR6	DIODE, SILICON VARICAP, IN3182	145-001	R19	RESISTOR, FIXED, COMPOSITION, 270 ohm, 10%, 1/2 W	223-271
			R20	RESISTOR, FIXED, COMPOSITION, 330 K, 10%, 1/2 W	223-334
			R21	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122
			R22	RESISTOR, FIXED, COMPOSITION, 470 ohm, 10%, 1/2 W	223-471
			R23	RESISTOR, FIXED, COMPOSITION, 220 ohm, 10%, 1/2 W	223-221
			R24	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
			R25	RESISTOR, FIXED, COMPOSITION, 120 ohm, 10%, 1/2 W	223-121
			R26	RESISTOR, FIXED, COMPOSITION, 150 K, 10%, 1/2 W	223-154
I1	LAMP, INCANDESCENT, FROSTED #H1847	150-101	R27	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333
I2	LAMP, INCANDESCENT, FROSTED #H1847	150-101	R28	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122
			R29	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
			R30	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224
			R31	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
			R32	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 2 W	227-222
			R33	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223
			R34	RESISTOR, FIXED, COMPOSITION, 120 ohm, 10%, 1/2 W	223-121
K1	RELAY, 12 VDC, 4 PDT	174-001	R35	RESISTOR, FIXED, COMPOSITION, 12 K, 10%, 1 W	225-123
K2	RELAY, 12 VDC, 4 PDT	174-001	R36	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122
			R37	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
			R38	RESISTOR, FIXED, COMPOSITION, 47 ohm, 10%, 1/2 W	223-470
			R39	RESISTOR, FIXED, COMPOSITION, 47 ohm, 10%, 1/2 W	223-470
			R40	RESISTOR, FIXED, COMPOSITION, 120 ohm, 10%, 1/2 W	223-121
			R41	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333
			R42	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-222
			R43	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473
			R44	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473
			R45	RESISTOR, FIXED, COMPOSITION, 270 ohm, 10%, 1/2 W	223-271
L1	INDUCTOR, 7 TURNS OF AIR-DUX CENTER-TAPPED	191-007	R46	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223
L2	INDUCTOR, 1-2 μ h, 5-693	182-004	R47	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333
L3	INDUCTOR, 1-2 μ h, 5-693	182-004	R48	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473
L4	INDUCTOR, SLUG-TUNED, 6-173	182-012	R49	RESISTOR, FIXED, COMPOSITION, 680 K, 10%, 1/2 W	223-684
L5	INDUCTOR, SLUG-TUNED, 6-173	182-012	R50	RESISTOR, FIXED, COMPOSITION, 330 K, 10%, 1/2 W	223-334
L6	INDUCTOR, 1-2 μ h, 5-693	182-004	R51	RESISTOR, FIXED, COMPOSITION, 1 MEG, 10%, 1/2 W	223-105
L7	INDUCTOR, 40 μ h, 6-413	182-013	R52	RESISTOR, FIXED, COMPOSITION, 470 K, 10%, 1/2 W	223-474
L8	INDUCTOR, BALANCE ADJ.	182-017	R53	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473
L9	INDUCTOR, 40 μ h, 6-413	182-013	R54	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
L10	INDUCTOR, SLUG-TUNED, 6-173	182-012	R55	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224
L11	INDUCTOR, SLUG-TUNED, 6-173	182-012	R56	RESISTOR, FIXED, COMPOSITION, 470 K, 10%, 1/2 W	223-474
L12	INDUCTOR, AIR-DUX, 13 TURNS CENTER-TAPPED	191-009	R57	RESISTOR, FIXED, COMPOSITION, 330 ohm, 10%, 1/2 W	223-331
L13	INDUCTOR, RFC CHOKE, 5-677	190-002	R58	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
L14	INDUCTOR, 6 TURNS CLEGG COIL		R59	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
L15	INDUCTOR, SLUG-TUNED, 26 TURNS SOLENOID WOUND, #22 GAUGE	182-018	R60	RESISTOR, FIXED, COMPOSITION, 2.2 MEG, 10%, 1/2 W	223-225
L16	INDUCTOR, RF CHOKE Z50	190-004	R61	RESISTOR, FIXED, COMPOSITION, 100 K, 10%, 1/2 W*	223-104
L17	INDUCTOR, RF CHOKE Z144	190-005	R62	RESISTOR, FIXED, COMPOSITION, 680 K, 10%, 1/2 W	223-684
L18+			R63	RESISTOR, FIXED, COMPOSITION, 330 K, 10%, 1/2 W	223-334
R137	PARASITIC CHOKE, 1/2 TURN OF BRAID		R65	RESISTOR, FIXED, COMPOSITION, 1.2 MEG, 10%, 1/2 W	223-125
			R66	RESISTOR, FIXED, COMPOSITION, 1.2 MEG, 10%, 1/2 W	223-125
			R67	VARISTOR, G. E. #67D5010	249-002
			R68	RESISTOR, FIXED, COMPOSITION, 3.3 MEG, 10%, 1/2 W	223-335
			R69	RESISTOR, FIXED, COMPOSITION, 180 ohm, 10%, 1/2 W	223-181
			R70	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333
			R71	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333
			R72	RESISTOR, FIXED, COMPOSITION, 100 K, 10%, 1/2 W	223-104
			R73	RESISTOR, FIXED, COMPOSITION, 39 K, 10%, 1/2 W	223-393
M1	METER, 1 MA, S METER	409-004	R74	RESISTOR, FIXED, COMPOSITION, 4.7 K, 10%, 1/2 W	223-472
M2	METER, 200 MA, CATHODE CURRENT	409-005	R75	RESISTOR, FIXED, COMPOSITION, 2.2 MEG, 10%, 1/2 W	223-225
			R76	RESISTOR, FIXED, COMPOSITION, 56 K, 10%, 1/2 W	223-563
			R77	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
			R78	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124
			R79	RESISTOR, FIXED, COMPOSITION, 56 K, 10%, 1/2 W	223-563
			R80	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222
			R81	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223
			R82	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223

* NOMINAL VALUE. ADJUSTED AT FACTORY.

PARTS LIST (Cont'd.)

ITEM	DESCRIPTION	PART NUMBER	ITEM	DESCRIPTION	PART NUMBER
R83	RESISTOR, FIXED, COMPOSITION, 18 K, 10%, 1/2 W	223-183	S1	SWITCH, SPST, (Part of R1)	
R84	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122	S2	SWITCH, SPST, (Part of R2)	
R85	RESISTOR, FIXED, COMPOSITION, 470 K, 10%, 1/2 W	223-474	S3	SWITCH, SPST, (Part of R3)	
R86	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124	S4A	SWITCH, DPST, (Part of R4)	
R87	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124	S4B	SWITCH, DPST, (Part of R4)	
R88	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124	S5	SWITCH, DPDT, TOGGLE	283-001
R89	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473	S6A, B	SWITCH, DPDT, (Part of R6)	
R90	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473	S7	SWITCH, SPST, TOGGLE	283-003
R91	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224			
R92	RESISTOR, FIXED, COMPOSITION, 18 K, 10%, 1/2 W	223-183			
R93	RESISTOR, FIXED, COMPOSITION, 12 K, 10%, 1/2 W	223-123			
R94	RESISTOR, FIXED, COMPOSITION, 56 K, 10%, 1/2 W	223-563			
R95	RESISTOR, FIXED, COMPOSITION, 27 K, 10%, 1 W	225-273			
R96	RESISTOR, FIXED, COMPOSITION, 270 K, 10%, 1/2 W	223-274			
R97	RESISTOR, FIXED, COMPOSITION, 27 K, 10%, 1/2 W	223-273			
R99	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223			
R100	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124			
R101	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124			
R102	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 2 W	227-223			
R103	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224			
R104	RESISTOR, FIXED, COMPOSITION, 330 ohm, 10%, 1/2 W	223-331			
R105	RESISTOR, FIXED, COMPOSITION, 120 ohm, 10%, 1/2 W	223-121			
R106	RESISTOR, FIXED, COMPOSITION, 12 K, 10%, 2 W	227-123	T1	TRANSFORMER, 14 MC IF	602-003
R107	RESISTOR, FIXED, COMPOSITION, 75 ohm, 5%, 1 W	224-750	T2	TRANSFORMER, 10.7 MC IF	602-002
R108	RESISTOR, FIXED, COMPOSITION, 820 ohm, 10%, 1/2 W	223-821	T3	TRANSFORMER, 10.7 MC IF	602-002
R109	RESISTOR, FIXED, COMPOSITION, 47 K, 10%, 1/2 W	223-473	T4	TRANSFORMER, 456 KC IF	602-001
R110	RESISTOR, FIXED, COMPOSITION, 1.8 K, 10%, 1/2 W	223-182	T5	TRANSFORMER, 456 KC IF	602-001
R111	RESISTOR, FIXED, COMPOSITION, 27 K, 10%, 1/2 W	223-273	T6	TRANSFORMER, AUDIO OUTPUT	603-002
R112	RESISTOR, FIXED, COMPOSITION, 2.2 K, 10%, 1/2 W	223-222	T7	TRANSFORMER, 14 MC IF	602-003
R113	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223	T8	TRANSFORMER, 14 MC IF	602-003
R114	RESISTOR, FIXED, COMPOSITION, 1 MEG, 10%, 1/2 W	223-105			
R115	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224			
R116	RESISTOR, FIXED, COMPOSITION, 330 ohm, 10%, 1/2 W	223-331			
R117	RESISTOR, FIXED, COMPOSITION, 15 K, 10%, 1/2 W	223-153			
R118	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122			
R119	RESISTOR, FIXED, COMPOSITION, 6.8 K, 10%, 1/2 W	223-682			
R120	RESISTOR, FIXED, COMPOSITION, 150 ohm, 10%, 1/2 W	223-151			
R121	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224			
R122	RESISTOR, FIXED, COMPOSITION, 27 K, 10%, 1 W	225-273			
R123	RESISTOR, FIXED, COMPOSITION, 330 K, 10%, 1/2 W	223-334			
R124	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223			
R125	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122			
R126	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223			
R127	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124			
R128	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1 W	225-223	V1	ELECTRON TUBE, 6CW4	216-020
R129	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122	V2	ELECTRON TUBE, 6EH7	216-023
R130	RESISTOR, FIXED, COMPOSITION, 120 K, 10%, 1/2 W	223-124	V3	ELECTRON TUBE, 6EH7	216-023
R131	RESISTOR, FIXED, COMPOSITION, 180 ohm, 10%, 1/2 W	223-181	V4	ELECTRON TUBE, 12BA6	211-008
R132	RESISTOR, FIXED, COMPOSITION, 18 K, 10%, 1 W	225-183	V5	ELECTRON TUBE, 12BE6	211-009
R133	RESISTOR, FIXED, COMPOSITION, 820 ohm, 10%, 1/2 W	223-821	V6	ELECTRON TUBE, 12BA6	211-008
R134	RESISTOR, FIXED, COMPOSITION, 470 ohm, 10%, 1/2 W	223-471	V7	ELECTRON TUBE, 12AL5	211-001
R135	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122	V8	ELECTRON TUBE, 12BE6	211-009
R136	RESISTOR, FIXED, COMPOSITION, 10 ohm, 10%, 1/2 W	223-120	V9	ELECTRON TUBE, 12DW7	211-007
R137	RESISTOR, FIXED, COMPOSITION, 22 ohm, 10%, 1 W	225-220	V10	ELECTRON TUBE, 12AQ5	211-010
R138	RESISTOR, FIXED, COMPOSITION, 1.2 K, 10%, 1/2 W	223-122	V11	ELECTRON TUBE, 12DW7	211-007
R139	RESISTOR, FIXED, COMPOSITION, 22 K, 10%, 1/2 W	223-223	V12	ELECTRON TUBE, 7360	217-003
R140	RESISTOR, FIXED, COMPOSITION, 39 K, 10%, 1/2 W	223-393	V13	ELECTRON TUBE, 12AU6	211-012
R141	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224	V14	ELECTRON TUBE, 12AU6	211-012
R142	RESISTOR, FIXED, COMPOSITION, 220 K, 10%, 1/2 W	223-224	V15	ELECTRON TUBE, 12BA7	211-004
R143	RESISTOR, FIXED, COMPOSITION, 470 K, 10%, 1/2 W	223-474	V16	ELECTRON TUBE, 12BY7	211-011
R144	RESISTOR, FIXED, COMPOSITION, 470 ohm, 10%, 1/2 W	223-471	V17	ELECTRON TUBE, 6883	216-001
R145	RESISTOR, FIXED, COMPOSITION, 10K, 10%, 1/2 W	223-103	V18	ELECTRON TUBE, 6DJ8	216-021
R146	RESISTOR, FIXED, WIRE WOUND, 900 ohm, 20 W	235-003	V19	ELECTRON TUBE, 12AU7A	211-002
R147	RESISTOR, FIXED, COMPOSITION, 4.7 K, 10%, 2 W	227-472	V20	ELECTRON TUBE, 0A2	210-001
R148	RESISTOR, FIXED, COMPOSITION, 4.7 K, 10%, 2 W	227-472	V21	ELECTRON TUBE, 6U8A	216-024
R149	RESISTOR, FIXED, COMPOSITION, 39 ohm, 10%, 2 W	227-390			
R150	RESISTOR, FIXED, COMPOSITION, 82 ohm, 10%, 1 W	225-820			
R151	RESISTOR, FIXED, COMPOSITION, 75 ohm, 5%, 1 W	224-750			
R152	RESISTOR, FIXED, COMPOSITION, 47 ohm, 10%, 1/2 W	223-470			
R153	RESISTOR, FIXED, COMPOSITION, 33 K, 10%, 1/2 W	223-333			



- NOTES:
- UNLESS OTHERWISE STATED
ALL CAPACITORS ARE IN P.F.
ALL RESISTORS ARE IN OHMS, 10% 1/2W
 - INDICATES FRONT PANEL FACILITY
 - SHOWN IN "OFF" POSITION
S2 "ON" "
S3 "ON" "
S4A, B "CW" "
S4B "CW-SLOW" "
S6 "2000" "
S7 "SLOW" "
K1 "REC" "
K2 " " "
 - ALL POTS SHOWN IN CW POSITION
 - * DENOTES FACTORY ADJUST AND NOMINAL VALUE

Clegg LABORATORIES DIV. OF ROYALTY-SANDERS, INC.		
SCHEMATIC DIAGRAM VENUS		
DRAWN BY ERD	SCALE	MATERIAL
CARD G S	DATE 1-21-64	DRAWING NO.
TYPECD	APPRO G S 1-24-64	EIO-512

